

## Nature-based tourism and the behaviour of Bottlenose Dolphins *Tursiops* spp. in Port Phillip Bay, Victoria, Australia

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### Abstract

Nature-based tourism targeting cetaceans is a billion dollar industry that continues to grow. Therefore, the ecological effects of this industry require investigation. Inshore marine wildlife, such as coastal populations of dolphins that have become tourism targets, is affected by human activities in the coastal zone, and tourism may be an additional stressor. The focus of marine wildlife tourism in southern Port Phillip Bay, Victoria, Australia, is a coastal population of bottlenose dolphins (*Tursiops* spp.). Commercial dolphin-swim and dolphin-watch operations seek out dolphins. This study monitored activity budgets of bottlenose dolphins at one site, in the presence and absence of vessels during a two-year period through land-based observations. The results demonstrate a significant decreased likelihood of bottlenose dolphins engaging in feeding behaviour when vessels were present. Schools with calves were significantly larger than groups without and vessel presence resulted in larger schools regardless of school composition. Results also indicated that the number of dolphins observed at the study site were lower during afternoon ebb tides and on afternoon slack tides. The significance of their reduced feeding in the long-term conservation of these dolphins will remain unclear until information is available on their behaviour in areas into which tourist operators do not venture. (*The Victorian Naturalist* 127 (3), 2010, 64-70).

**Keywords:** Whalewatching, feeding, *Tursiops*, Port Phillip Bay, Tourism and Sustainability

### Introduction

Nature-based tourism provides opportunities for people to view wildlife in relatively natural settings. However, provision of these opportunities may entail costs, such as the risk of disturbance to the species under observation (e.g. Lott and McCoy 1995). Human activities in coastal waters have resulted in ecological changes, and the impacts of nature-based tourism are unlikely to cause damage on a scale similar to some other human activities such as fisheries (Jackson *et al.* 2001; Watling and Norse 1998). However, the scale and extent of some forms of this tourism have changed substantially in recent years, particularly the commercial industry associated with taking people to sea to view cetaceans. Therefore, their possible impacts deserve further investigation. Whalewatching now occurs in over 80 countries, servicing in the range of nine million people per year in recent years (Hoyt 2001).

Studies have demonstrated that whalewatching can cause both short- and long-term changes in the behaviour of cetaceans (e.g. Corkeron 1995;

Constantine 2001; Constantine *et al.* 2004; Janik and Thompson 1996; Bejder *et al.* 2006; do Volle and Cunha Melo 2006, Santos *et al.* 2006, Stockin *et al.* 2008); however, assessing the impacts of whalewatching can be confounded by the way in which study design is influenced by the logistic constraints of working in marine settings. Observations solely from whale-watching vessels are limited as it is impossible to have a 'control' category for analysis. Nevertheless, long-term changes in basic behavioural responses have been demonstrated using this technique (Constantine 2001). As cetaceans usually detect vessels acoustically, a small sailing vessel under sail (and therefore silent) has been used to collect 'control' data (Corkeron 1995). However, this technique is difficult to apply to faster-moving cetaceans. Motorised vessels with the motor off have been used also, but their lack of manoeuvrability limits the data that can be collected (e.g. Scarpaci *et al.* 2000). Aerial platforms (fixed wing aircraft or airships) have been used to assess other human